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**Inventor (s):** SEIBEL, Richard A.  
WEINER, Christopher R.

McLean, VA 22102  
Attorneys  
Telephone: (703) 905-2000

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☐ Continuing Application

☐ The contents of the parent are incorporated by reference

☐ PCT National Phase Application

☐ Design Application

☐ Reissue Application

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## **NETWORK-ATTACHED INTERACTIVE UNIFIED MESSAGING DEVICE**

### **BACKGROUND**

#### **1. Field**

[0001] This invention relates in general to messaging. Specifically, this invention relates to a system and method for unified messaging.

#### **2. General Background and Related Art**

[0002] The field of messaging has evolved rapidly in recent years, due in large part to advancements in telecommunications technologies. Messaging services, which ensure that messages from a sender are delivered to an absent recipient, have become ubiquitous. Such services include messaging devices intended for home use, such as answering machines or computers equipped with telephonic functions, as well as messaging services offered by service providers, such as voicemail boxes.

[0003] Messaging technologies manage recorded messages. Specifically, messages may be accessed in analog form or digital form and retrieved based on various criteria, such as date or time. Unified messaging integrates messaging capabilities on different platforms and enables a user to access and retrieve messages recorded in different modalities and on different platforms. For example, a user may retrieve conventional voice messages via an e-mail box. Similarly, a user may listen to e-mail messages which are read aloud by a text-to-speech (TTS) engine.

[0004] Caller ID, a service offered by service providers, sends identifying information of a caller to a callee when the caller places a call. A messaging system may record caller ID data along with a message left by the callee. As such, messages may be indexed and



[0011] It will be apparent to one of ordinary skill in the art that the embodiments as described below may be implemented in many different embodiments of software, firmware, and hardware in the entities illustrated in the figures. The actual software code or specialized control hardware used to implement the present invention is not limiting of the present invention. Thus, the operation and behavior of the embodiments will be described without specific reference to the actual software code or specialized hardware components. The absence of such specific references is feasible because it is clearly understood that artisans of ordinary skill would be able to design software and control hardware to implement the embodiments of the present invention based on the description herein with only a reasonable effort and without undue experimentation.

[0012] Moreover, the processes associated with the presented embodiments may be stored in any storage device, such as, for example, a computer system (non-volatile) memory, an optical disk, magnetic tape, or magnetic disk. Furthermore, the processes may be programmed when the computer system is manufactured or via a computer-readable medium at a later date. Such a medium may include any of the forms listed above with respect to storage devices and may further include, for example, a carrier wave modulated, or otherwise manipulated, to convey instructions that can be read, demodulated/decoded and executed by a computer.

[0013] A method and system for an interactive unified messaging device, as described herein, involves receiving a call by an interactive unified messaging device. The caller is identified by caller ID information conveyed with the call. A configuration for the caller is retrieved based on the caller ID information. The call is then responded to based on the configuration of the caller.

[0014] A caller may include a party that, for example, places a telephone call or sends an e-mail message. Caller ID information may include a host of information, such as a telephone number, an e-mail address, the name of a caller, or the name of an organization.

[0015] FIG. 1 is a high-level diagram of system 100 according to an embodiment of the present invention. System 100 comprises public switched telephone network (PSTN) 110, messaging unit 130, Internet access device 140, input device 195, and telephone 160.

[0016] Messaging unit 130 receives a call originating from PSTN 110. The call conveys caller ID data 120 and other signals, such as audio signals. A configuration for the caller may have been previously stored and associated with the caller's caller ID data 120. As such, messaging unit 130 may retrieve the stored configuration using a portion or all of the caller ID data 120 as an index. Messaging unit 130 may then respond to the call based on the retrieved configuration.

[0017] If no caller ID data is available, or the conveyed data does not match to an existing configuration, default rules or configurations may be used to respond to the call. Such rules may be defined by software, user inputs, or a combination thereof. An exemplary default rule may include forwarding the call to voicemail. Alternatively, a user 105 of messaging unit 130, at the time of a call, may be prompted for an input that specifies how the call should be handled.

[0018] Processing of the caller ID data and retrieval of a stored configuration, default rules, or user input may occur before telephone 160 rings. Software and firmware in messaging unit 130 may be automatically updated via an Internet connection or automated telephone calls.

[0019] Input device 195 may comprise, for example, a keypad, a mouse and keyboard, or a voice recognition input mechanism in a personal computer.

[0021] System 100 may comprise Internet access device 140. Internet access device 140 may comprise a computer configured to access the Internet 170. Messaging unit 130 interfaces with Internet access device 140 over a connection, such as over a local area network (LAN). Via the Internet 170, Internet access device 140 may access a host of information resources, such as, for example, voicemail server 180 and e-mail server 190. As such, messaging unit 130 may provide unified messaging capabilities to user 105, wherein messaging unit 130 may transmit to, and receive from, other Internet-connected systems, voicemail messages, e-mail messages, or other such information. Messaging unit 130 may transmit and receive other types of data. For instance, messaging unit 130 may transmit and receive voice signals in a Voice over IP (VoIP) connection between messaging unit 130 and other local and remote nodes. It is to be understood that the present invention may be incorporated into various other settings, such as intranets or PBX-based networks.

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locally, remotely, or both. It is to be noted that a number of such personal access devices 150 may be interfaced with messaging unit 130. Accordingly, user 105 of messaging unit 130 may issue commands to messaging unit 130, receive messages or status information from messaging unit 130, or effectuate other such exchanges of information. For instance, a user may request status information, input or change a configuration of messaging unit 130, access individual messages, skip messages, play messages, or forward messages, via Internet access device 140, to a remote node connected to Internet 170.

[0023] FIG. 2 is a high-level block diagram of messaging unit 130 according to an embodiment of the present invention. Messaging unit 130 may comprise receiver 210, configuration retriever 220, response agent 230, configurator 250, and configuration storage unit 240. It is to be appreciated that configuration storage unit 240, as well as various other components within messaging unit 130, may reside in one or more external locations if messaging unit 130 may access those locations.

[0024] Receiver 210 receives a call originating from PSTN 110 that conveys caller ID data 120. Receiver 210 may parse caller ID data 120 to extract information, such as the name of a caller, that may be used by configuration storage unit 240 to index configurations. Configuration retriever 220 receives caller ID data 125 as input. Caller ID data 125 may comprise caller ID data extracted from caller ID data 120 by receiver 210.

[0025] Using caller ID data 125 as an index, configuration retriever 220 may access configuration storage unit 240. Response agent 230 may take appropriate action based on configuration information retrieved by configuration retriever 220. Apart from accesses it may make in conjunction with received calls, configuration retriever 220 may also scan configuration storage unit 240 to determine whether actions should be taken with respect to a configuration stored in configuration storage unit 240. For example, configuration retriever 220 may find that a configuration associated with user 105 indicates that a call

should be placed to another party at a prescribed time. Response agent 230 may then place the call at the prescribed time.

[0026] Configuration storage unit 240 may store a set of configurations associated with caller ID information. Accordingly, a configuration may be associated with any entity, such as an individual or an organization. For example, configuration storage unit 240 may maintain a configuration for "Public, John Q." Each configuration may involve various operations or functions, settings, or parameters that may be invoked with respect to a particular caller. In some embodiments, one configuration may exist for each set of caller ID data. In other embodiments, multiple configurations may be set up for one set of caller ID data, with only one configuration being active at a given time. In still other embodiments, configuration storage unit 240 may store a configuration for user 105. Such a configuration may include special options, such as wake-up call functions, which apply to user 105, but not to outside parties.

[0027] Configurator 250 may set up a configuration for storage in configuration storage unit 240. Setup may occur automatically, such as through assignment of default actions by the system, manually by user 105, or by a combination of system and user interaction. User 105 may set up a configuration via input device 195, telephone 160, personal access device 150, or other such mechanisms.

[0028] In an exemplary implementation, configurations may contain static and dynamic information associated with caller ID information. For instance, a configuration may specify a ringing pattern. Specifically, an exemplary configuration associated with a caller may specify whether telephone 160 should ring when the caller calls, whether telephone 160 should ring a predetermined number of times, or whether telephone 160 should ring with a distinctive sound.



[0029] In addition, a configuration may specify customized greetings, recorded by user 105 or the system, that may play depending on the time of day of the call, the day of week, the day of the month, the day of the year, or other inputs, such as, for example, inputs from a scheduling application such as Microsoft Outlook.

[0030] Further, a configuration may define forwarding behavior. If user 105 is absent, a call may be forwarded to another telephone number, to voicemail, to e-mail, or to another such destination. Therefore, a user may specify a mail forwarding option and a mail forwarding address. For instance, a user could specify e-mail and an e-mail address, telephone and a telephone number, or pager and a pager number.

[0031] Another configuration option may include customizing response behavior based on scheduling information. For example, if user 105 of messaging unit 130 is on vacation or away from messaging unit 130 for another activity, voicemail messages may be recorded and attached to e-mail messages as digital audio files. The e-mail messages may be sent to user 105 until user 105 returns from vacation. Similarly, if the caller associated with a configuration provides, via DTMF tones, voice recognition, or another input method, his or her availability for the day, messaging unit 130 may automatically place a call to the caller when both the caller and user 105 are available. Additionally, the caller may indicate a time for user 105 to return the call, and messaging unit 130 may automatically return the call at the designated time.

[0032] Priority may affect customized response behavior. For instance, when messaging unit 130 needs to place callbacks to multiple callers, the order of the calls may be based on priority. Call filtering may be accomplished in various ways. A caller may be associated with information that indicates the caller's priority; the caller may provide to an access control mechanism (not shown) access control information, such as a password, when placing a call to messaging unit 130. In other embodiments, the caller's

configuration may include a priority level. As such, messaging unit 130 may differentiate among various callers.

[0033] A configuration may also trigger an event reminder, wherein messaging unit 130 reminds a caller or user 105 of a specified event. The time and nature of the event, and a mechanism through which the event reminder is to be executed, such as a TTS engine, e-mail, or Braille, may also be specified. The event reminder may be executed at system- or user-designated times before or after the event is to occur, such as at one hour intervals preceding the event and at 10 minute intervals after the event has begun.

[0034] For instance, messaging unit 130 may place a call to an individual having a configuration in configuration storage unit 240 two hours before a scheduled luncheon between the individual and user 105. The voice signals of the call may be generated by a TTS engine, which may remind the individual that "You have a luncheon at 12:00 noon with Jane. Speak 'Yes' or 'No' to confirm your attendance." Messaging unit 130 may also provide user 105 with reminder functions, such as wake-up calls containing a summary of the day's scheduled activities. Messaging unit 130 may interface with appointment software, such as Microsoft Outlook, to effectuate such functions.

[0035] In other embodiments, a status or configuration of messaging unit 130 may be retrieved and reported on a medium. For instance, a caller's message may be retrieved from messaging unit 130 or a remote storage device such as a voicemail server 180, e-mail server 190, or a Web page on a Web server connected to Internet 170. In particular, the caller's message may be retrieved from an e-mail message, wherein the voice message is attached thereto as a digital audio file. Statistics relating to the caller may also be retrieved from messaging unit 130, such as the number of calls placed by, or made to, the caller, an average duration of the calls, and preferred callback time.

[0036] Status of messaging unit 130 may be reported in various ways, such as by playing back voice messages, displaying the status on a display screen coupled to or incorporated within messaging unit 130, annunciating the status via a TTS engine, and transmitting the status via a Braille-equipped input/output mechanism, a personal computer (PC), or the Internet. It is to be appreciated that personal access device 150 in FIG. 1 may initiate requests for status information. In certain embodiments, messaging unit 130 may spontaneously notify user 105 about status information, such as via personal access device 150.

[0037] In other embodiments, after a new caller places a first call to user 105, user 105 may optionally define a new configuration associated with the new caller. Such a configuration may be retrieved when the caller makes subsequent calls to user 105. In another implementation, voice print analysis may be used to identify a caller when the caller's configuration cannot be retrieved from messaging unit 130 on the basis of caller ID information conveyed with the call.

[0038] FIG. 3 is a flow diagram illustrating method 300 according to an embodiment of the present invention. In item 301, a configuration is set up based on the caller ID information of a caller. The configuration is stored in item 310. A call is received in item 320. In item 330, method 300 determines whether a stored configuration is associated with the caller ID information. If such a configuration exists, then the configuration is retrieved in item 340. In item 350, the call is responded to based on the retrieved configuration. If a stored configuration is not associated with the caller ID information, then the call is responded to based on default rules in item 360.

[0039] The foregoing description of the preferred embodiments is provided to enable any person skilled in the art to make or use the present invention. Various modifications to these embodiments are possible, and the generic principles presented herein may be

applied to other embodiments as well. For instance, messaging unit 130 may spontaneously forward received information to user 105, such as e-mail messages received by e-mail server 190 that are designated as urgent.

[0040] Further, the invention may be implemented in part or in whole as a hard-wired circuit, as a circuit configuration fabricated into an application-specific integrated circuit, or as a firmware program loaded into non-volatile storage or a software program loaded from or into a data storage medium as machine-readable code, such code being instructions executable by an array of logic elements such as a microprocessor or other digital signal processing unit.

[0041] As such, the present invention is not intended to be limited to the embodiments shown above but rather is to be accorded the widest scope consistent with the principles and novel features disclosed in any fashion herein.

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